



X-FAB 0.35, 0.18, 0.13 μ m & XMB10 MEMS PROTOTYPING AND VOLUME PRODUCTION

Picture Source: X-FAB

EUROPRACTICE offers Multi-Project-Wafer and Volume Production services of X-FAB to academic institutions together with small and medium-sized enterprises.

Why EUROPRACTICE?

- ▶ Affordable and easy access to Prototyping and Small Volume Production services for academia and industry.
- ▶ MPW (Multi-Project-Wafer) runs for various technologies, including ASICs, Photonics, MEMS and more.
- ▶ Advanced packaging, system integration solutions and test services.

Why X-FAB?

- ▶ The world's leading foundry group for analog/mixed-signal semiconductor applications.
- ▶ Technologies ranging from 1.0 to 0.13 μ m mixed-signal CMOS, special SOI and MEMS long lifetime processes for automotive, industrial, medical and other applications.
- ▶ Six manufacturing sites in Germany, France, Malaysia and the USA.

Technology Highlights

XH035: Modular Mixed-Signal Technology with HV Extensions

This technology is based on a single poly triple metal 0.35 μ m drawn gate length process for digital applications. It features core and process modules such as low Vt, low leakage, embedded non-volatile memory (NVM) and high voltage (HV) options, as well as standard or thick fourth layer of metal, double poly and MIM capacitors and high resistance polysilicon. MOS and bipolar transistors are also available. World class low noise p-mos and n-mos transistors make this technology the first choice for applications requiring very low noise and high signal-to-noise ratios, for instance, for industrial, automotive and telecommunication products. In addition, Noble Metal Au/Pt finish is available for MLM services.

XH018: Modular Mixed-Signal HV CMOS Technology

Based upon the industrial standard single poly with up to six metal layers 0.18 μ m drawn gate length Nwell process. It is the industry's first and only 0.18 μ m technology to integrate high temperature (HT), HV and NVM all in a single platform. It is ideal for SoC applications in the automotive market such as control devices inside combustion engine compartments or electric engine housings with temperature range up to 175 $^{\circ}$ C, as well as embedded HV applications in the communications, consumer and industrial market.

XT018: Modular HV SOI CMOS Technology

It combines the benefit of SOI wafers with Deep Trench Isolation (DTI) and those of a state-of-the-art six metal layers 0.18-micron process. HV support up to 200V combined with range of NVM options. The XT018 platform is specifically designed for a next generation automotive, industrial and medical applications operating in the temperature range of -40 to 175 $^{\circ}$ C. Full PDK support for major EDA vendors, extensive device characterization and modeling, comprehensive analog, digital, and memory IPs.

XS018: Specialized Process for Fast Image Sensors

The optional modules for 4 transistor cells, pinned photo diodes and the stitching capabilities make this technology ideal for large image sensor applications needing high frame rates as used for medical and scientific X-ray cameras. The 3.3V core module allows a low mask count designs. It can also be used for low power SOC application in the automotive, industrial and medical markets.

XP018: Modular CMOS Power Management

Based upon the industrial standard single poly with up to six metal layers 0.18-micron drawn gate length N-well process, integrated with high voltage and Non-Volatile-Memory modules, the platform is engineered for applications needing an integrated solution and cost efficient process for high performance ICs. Targeted applications are switching applications, lightings, display, etc; operating in temperature range of -40 to 175 °C.

XR013: RF SOI CMOS Technology

XR013 is a RF SOI (CMOS) 0.13 µm generation designed to serve RF applications. It features high-resistive 'trap-rich' SOI substrate (>3 kΩ-cm), low Ron*Coff switch NMOS transistor with minimum L = 0.22 µm, together with vertical parallel plate (VPP) capacitor and Metal-Insulator-Metal (MIM) capacitor.

XT011: Next generation BCD-on-SOI technology

It combines the benefit of SOI wafers with Deep Trench Isolation (DTI) and those of a state-of-the-art 110 nm process. XT011 features high voltage options and range of automotive grade-0 non-volatile memory options. It offers twice the standard cell library density compared to XT018. XT011 primarily targets next-generation automotive applications that require an increased level of data processing capabilities. In addition, it provides a path to a smaller geometry for industrial and medical products.

XMB10 MEMS

Based on Open Platform technology, XMB10 MEMS process supports fabrication of single, double or triple axis inertial sensors (Accelerometers/ Gyroscopes). It is a three wafer process and uses cavity SOI wafer-based technology. Sensor elements are formed by the silicon DRIE process. Optional top and bottom metal layers are possible. Top cap wafer has silicon with etched cavities and bond pad openings. We also offer cost-effective wafer-level packaging by wafer bonding.

Technology Details

XH035 3.3V/5V	XH018 1.8V/3.3V	XT018 1.8V/5V
<ul style="list-style-type: none"> 3 or 4 Metal layers, optional thick metal 5V or 18V dual gate for HV transistors Isolated MOS module, deep N-well and P-well Operating voltages 45V, 70V, 90V HR polysilicon up to 10 K ohm/sq MIM capacitor (1.25fF/µm²) Depletion NMOS Module Tiny EEPROM 	<ul style="list-style-type: none"> 4 or 6 Metal layers, thick metal layer Triple well isolated CMOS module 10V-45V HV CMOS transistors, 18V gate oxide HV Schottky Diodes Medium R, P-doped polysilicon 960 ohm/sq 1.8V low Vt module additional N-well, P-well MIM (1fF/µm²) or MIMH capacitor (2.3fF/µm²) NVM module for NVRAM and FLASH Support of photodiodes and SPAD 	<ul style="list-style-type: none"> 4 or 6 Metal layers, thick metal layer Deep trench isolation 10-200V HV transistors Subblock module 1.8V for 1.8V/5.0V PNP bipolar transistors 7.0V N-type protection diode (DPC) N-buried high voltage handle wafer diodes Top side handle wafer contact HR N-doped polysilicon resistor 6.3 ohm/sq MIM (1fF/µm²) or MIMH capacitor (2.3fF/µm²)
XS018 1.8V/ 3.3V	XP018 1.8V/5V	XR013
<ul style="list-style-type: none"> 4 or 6 Metal layers, thin metal layer 4T based CMOS imaging sensors Selection of pinned photo diodes 3.3V buried channel NMOS in pixel Selection of 3.3V low Vt NMOS in pixel MIM (1fF/µm²) or MIMH capacitor (2.3fF/µm²) 1k ohm/sq polysilicon resistor module Flat passivation for microlense or colour filtering, post process 	<ul style="list-style-type: none"> 4 or 6 Metal layers, thick metal layer 12V - 60V HV transistors Medium R P-doped polysilicon resistor 960 ohm/sq HR P-doped polysilicon resistor 6.7k ohm/sq MIM (1fF/µm²) or MIMH capacitor (2.3fF/µm²) Ready-to-use EEPROM memory block (SONOS based) 	<ul style="list-style-type: none"> 4 to 8 Metal Levels Hybrid Cu/Al, thick metal module 2.5V RF Switches 1.2V Low-noise, high gain, high linearity NFET options for LNA Low and high value diffusion, poly resistors RF capacitor: MIM (2.1 fF/mm²) HR P-doped polysilicon resistor 6.7k ohm/sq RF varactors Regular Vt 1.2V digital CMOS High-density highVt 1.2V digital CMOS

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